

Table 1: Canola variety performance under limited irrigation* at the USDA Research Station, Akron Colorado in 2007.

Variety	Oil Profile						
	Test	Yield	Oleic	Linoleic	Linolenic	Erucic	Total
	Weight		(C18:1)	(C18:2)	(C18:3)	(C22:1)	Saturated
lb/bu	lb/ac	%	%	%	%	%	
BSX-42048	45.9	1777	62.92	19.06	7.05	2.15	7.57
BSX-42138	48.5	1775	36.31	16.30	5.72	12.41	7.55
BSX-41039	46.7	1752	60.07	18.60	5.66	2.48	9.50
Hycola 401	48.0	1681	64.69	17.76	6.93	1.30	9.41
BSX-42016	46.3	1634	60.52	18.56	5.78	2.93	8.38
BSX-41004	44.3	1628	61.94	21.02	5.89	1.29	8.85
Arid	42.2	1622	58.37	20.27	6.36	2.38	9.66
BSX-41067	46.3	1601	64.80	18.23	5.46	1.58	7.67
BSX-42015	46.1	1599	63.51	18.98	5.97	1.90	7.98
BSX-42191	46.7	1591	63.20	19.44	5.50	1.54	8.72
BSX-42100	46.0	1562	61.20	18.79	5.67	2.91	8.38
BSX-42089	45.8	1506	63.59	20.03	5.39	1.30	8.23
Hyclass 905	45.7	1498	64.78	18.30	5.78	1.70	8.25
BSX-42095	46.5	1489	61.57	18.92	10.05	2.67	9.16
BSXE-001	38.2	1479	16.87	19.10	6.95	6.97	7.29
BSX-42078	46.3	1470	63.12	19.49	5.04	1.78	8.52
Dhendra	44.6	1406	60.52	19.04	5.57	2.28	8.75
Crambe		982					
Average	45.5	1299	58.12	18.93	6.16	2.92	8.46
LSD $\alpha=0.3$			10.18	1.00	1.00	1.14	0.88
LSD $\alpha=0.05$	2.51	360.00	19.69	1.93	1.94	2.20	1.70
CV (%)	3.31	14.00	20.37	6.12	18.9	30.96	12.09

*Limited irrigation total water received (precipitation plus irrigation) = 10.08 inches

Date of planting: 5/12/2007
Date of harvest: 7/24/2007
Previous Crop: wheat
Fertilizer: 50-0-0
Herbicide: Sonalan (2pint/ac)
Insecticide: 2xMustang (2pints/ac)
Plot Size: 5ft x 15ft
Seeding Rate: 6lbs/ac

****Oil Profile Key:**

Most desirable oil for biofuel is one with a long carbon chain and one double bond which will have lower cloud point (solidify), lower viscosity, more lubricity and more complete combustion.

1. Oleic fatty acid, C18:1: Fatty acid a chain of 18 carbons and one double bond. It has the formula $C_{18}H_{34}O_2$ (or $CH_3(CH_2)_7CH=CH(CH_2)_7COOH$). This is the main monounsaturated fatty acid for high stability, better engine performance and health benefits.
2. Linoleic fatty acid C18:2: chain of 18 carbons and two double bonds, more common name is Omega 6 with more health benefits than C18:1.
3. Linolenic fatty acid, C18:3: Chain of 18 carbons and 3 double bonds, more common name is omega 3 with good health properties but more unstable over time due to the instability of the double bonds.
4. Erucic fatty acid, C22:1: Chain of 22 carbons and 1 double bond. Erucic acid has negative health properties especially in the meal. Level below 5% of the oil content are accepted.
5. Total saturated fatty acid: Variable carbons chain length with no double bond which will have a higher cloud point and so will melt at higher temperatures.

Table 2: Commercial canola variety performance under limited irrigation* at the Nutri-Turf farm, Fort Collins, Colorado, in 2007.

Variety	Oil Profile							
	<u>Test</u>	<u>Height</u> inch	<u>Yield</u> lb/ac					<u>Total Saturated</u> %
	<u>Weight</u> lb/bu			<u>Oleic (C18:1)</u> %	<u>Linoleic (C18:2)</u> %	<u>Linolenic (C18:3)</u> %	<u>Erucic (C22:1)</u> %	
Hyola 401	42.4	37	761	64.37	17.68	7.34	0.08	8.18
5550 Invigor	34.9	43	407	59.30	20.46	8.30	0.01	8.83
V1035	37.2	38	405	67.92	16.52	3.20	0.06	9.21
Hyola 357 Magnum	42.0	36	362	64.96	17.95	6.80	0.00	8.59
IS7145RR	25.1	38	340	62.55	19.96	7.33	0.01	8.23
45H21	25.1	39	328	64.81	18.29	7.00	0.01	7.94
SW Patriot	25.8	39	291	62.57	19.86	7.54	0.08	8.08
45H24	33.7	39	277	62.95	20.00	7.05	0.02	7.91
V2010	26.5	41	253	72.50	12.48	4.52	0.10	7.96
DKL52-10	26.7	39	237	59.27	20.15	8.45	0.32	8.59
924 Hyclass	24.2	34	227	61.67	20.46	7.28	0.00	7.90
Python CL	27.9	39	226	63.32	18.74	7.30	0.00	8.26
V2015	20.7	39	220	75.14	11.08	3.25	0.16	8.04
431 Hyclass	23.2	39	218	67.69	16.89	6.35	0.11	7.17
SW Marksman	24.5	37	215	62.44	18.84	7.52	0.10	8.41
712 Hyclass	17.0	39	209	61.13	21.15	6.88	0.11	8.48
V1031	26.1	37	199	64.97	21.85	3.57	0.06	7.49
DKL38-25	22.1	37	197	57.34	21.11	8.51	0.24	9.38
V1030	27.8	38	174	62.42	22.99	2.93	0.00	9.27
BSX 42016	16.7	35	172	55.13	22.01	9.04	1.96	8.12
BSX 42078	16.8	38	146	58.38	20.08	8.37	2.10	7.99
Hilite 618CL	11.8	36	137	65.21	19.17	6.80	0.00	7.27
905 Hyclass	12.3	40	134	60.87	21.05	7.80	0.03	8.33
45J10	11.8	43	79	52.94	22.93	10.75	0.16	10.17
Average	25.1	38	259	62.94	19.21	6.81	0.24	8.33
LSD $\alpha=0.05$	12.06	4.81	264.00	5.48	2.50	1.18	0.94	1.59
CV (%)	29.23	7.62	62.00	5.30	7.93	10.50	240.34	11.65

*Total water received (precipitation plus irrigation) = 13.7 inches

Date of planting:	5/14/2007	<u>Observations</u>	Very slow emergence, (3 weeks to a month) and cool soil temperatures
Date of harvest:	8/1/2007	<u>Comments:</u>	The planting depth was too deep The seeding rate too low (6 lbs/ac). Compaction occurred from the the planter wheels A thick crust due to very high soil sodium content
Previous Crop:	corn	<u>Recommendations:</u>	Increase seeding rate Choose a field with lower sodium content Shallow planting depth
Fertilizer:	None		
Herbicide:	Sonalan (4 pint/ac)		
Insecticide:	Mustang (2pints/ac)		
Plot Size:	5ft x 15ft		
Seeding Rate:	6lbs/ac		
Experiment design:	RCB with 3 rep		
Row spacing	7.5 inches		

Table 3: 2007 Nutri-Turf Soil Analysis for Sodium and Nitrogen Content from Olsen's Agricultural Laboratory, Nebraska.

Crops	Depth	pH	Nitrate-N	Bicarb-P	SAR*
			lbs/ac	ppm	
Oilseed	0-6	8.3	66	99	13.63
	6-12		84		17.03
Canola	0-6	8.5	93	92	18.89
	6-12		100		19
Soybean	0-6	8.1	108	128	17.59
	6-12		172		18.59
Camelina	0-6	8.1	123	107	12.9
	6-12		132		14.85
Safflower	0-6	8.3	99	128	15.54
	6-12		89		17.26

*Sodium Adsorption Ratio

Table 4: Commercial canola variety performance under full irrigation* at the USDA Research Station, Akron Colorado in 2007.

Variety	Test			Oil Profile				
	Weight	Height	Yield	Oleic (C18:1)	Linoleic (C18:2)	Linolenic (C18:3)	Erucic (C22:1)	Total Saturated
	lb/bu	inch	lb/ac	%	%	%	%	%
Hyola 357 Magnum	48.6	39.0	2451	67.12	16.60	5.26	0.00	9.40
V1035	48.9	42.0	2368	71.76	16.35	2.30	0.07	7.81
DKL38-25	48.1	47.3	2157	66.01	18.31	6.31	0.01	7.75
712 Hyclass	48.0	50.7	2155	65.11	19.00	5.76	0.03	8.32
IS7145RR	51.0	46.0	2135	66.16	17.13	5.06	0.01	9.38
SW Patriot	48.4	44.3	1979	63.60	19.43	6.82	0.01	8.12
DKL52-10	49.4	45.7	1948	64.74	19.09	6.79	0.00	7.77
924 Hyclass	47.4	46.3	1853	65.12	18.58	6.40	0.01	8.13
Hyola 401	49.7	34.7	1851	66.05	17.05	6.63	0.01	8.54
5550 Invigor	50.0	47.3	1816	64.15	19.18	6.76	0.03	7.91
V1031	50.0	48.7	1799	65.32	21.42	2.65	0.07	8.12
V2015	47.8	43.3	1787	80.74	7.34	1.94	0.00	8.09
45J10	47.1	48.7	1729	59.19	20.49	7.90	0.08	9.47
V2010	49.6	44.7	1704	77.56	9.98	2.73	0.14	7.77
431 Hyclass	47.1	44.7	1675	65.18	18.52	6.13	0.00	8.21
905 Hyclass	47.6	50.0	1661	65.72	19.25	5.50	0.00	8.05
SW Marksman	45.7	43.3	1557	65.90	17.93	6.25	0.00	8.07
BSX 42016	46.8	40.7	1497	59.55	18.21	6.16	2.60	8.65
V1030	49.2	44.0	1487	67.23	20.50	1.95	0.02	8.54
BSX 42078	48.3	40.7	1407	64.05	18.83	6.46	0.36	8.05
Python CL	46.6	43.3	1276	65.29	18.10	5.90	0.16	8.40
Hilite 618CL	47.8	41.3	953	65.95	18.80	5.72	0.02	7.92
Average	48.3	44.4	1784	66.43	17.73	5.34	0.16	8.29
LSD $\alpha=0.3$				0.90	0.64	0.41	0.12	0.58
LSD $\alpha=0.05$	3.16	4.51	446.0	1.74	1.24	0.78	0.23	1.12
CV (%)	3.97	6.17	15.00	1.59	4.23	8.95	85.08	8.23

*Full irrigation total water received (precipitation plus irrigation) = 11.08 inches

Date of planting: 5/12/2007
 Date of harvest: 7/24/2007
 Previous Crop: wheat
 Fertilizer: 50-0-0
 Herbicide: Sonalan (2pint/ac)
 Insecticide: 2xMustang (2pints/ac)
 Plot Size: 5ft x 15ft
 Seeding Rate: 6lbs/ac

Table 5: Commercial canola variety performance under limited irrigation* at the USDA Research Station, Akron Colorado in 2007.

Variety	Test Weight lb/bu	Height inch	Yield lb/ac	Oil Profile				Total Saturated %
				Oleic (C18:1) %	Linoleic (C18:2) %	Linolenic (C18:3) %	Erucic (C22:1) %	
V1035	48.4	42.3	2465	65.30	18.91	6.55	0.00	7.84
Hyola 357 Magnum	50.0	38.7	2397	60.23	19.99	8.08	0.00	9.20
IS7145RR	50.1	47.0	2271	64.07	19.89	6.53	0.00	7.71
V2010	49.3	50.0	2070	65.27	19.12	5.33	0.00	8.14
DKL38-25	48.1	46.3	2041	66.38	18.58	5.32	0.00	7.90
431 Hyclass	47.9	43.7	2033	64.94	19.00	6.52	0.00	7.91
924 Hyclass	48.9	46.7	2029	58.93	18.13	6.64	0.00	7.48
905 Hyclass	49.2	48.7	2013	63.49	18.03	6.83	0.00	7.41
DKL52-10	48.2	45.3	1979	66.18	18.64	6.03	0.01	7.65
V1031	50.9	47.7	1959	64.15	19.32	6.91	0.00	7.93
V2015	48.2	44.0	1940	65.75	19.09	5.66	0.02	7.79
Hyola 401	48.5	34.7	1934	67.80	16.30	5.56	0.00	8.77
V1030	49.3	47.3	1878	67.51	16.40	6.01	0.00	8.50
5550 Invigor	49.6	44.7	1876	67.64	17.49	5.25	0.00	7.99
Python CL	48.6	46.7	1754	66.26	18.49	5.62	0.00	7.93
BSX 42016	48.0	38.7	1640	66.53	17.82	5.98	4.27	7.92
SW Patriot	46.6	41.0	1634	64.11	19.60	6.17	0.00	8.25
BSX 42078	47.2	42.3	1620	67.19	21.05	1.86	1.29	8.32
712 Hyclass	47.6	43.3	1593	67.40	21.13	2.28	0.25	7.63
SW Marksman	47.7	41.3	1570	72.23	16.44	2.04	0.00	7.64
Hilite 618CL	47.3	41.7	1458	77.85	10.11	2.78	0.00	7.65
45J10	46.6	48.0	1440	80.46	7.84	2.09	0.00	7.78
Average	48.5	50.7	1891	66.80	17.79	5.27	0.27	7.97
LSD $\alpha=0.3$				0.87	0.63	0.35	0.17	0.29
LSD $\alpha=0.05$	2.55	4.26	442	1.67	1.22	0.68	0.33	0.56
CV (%)	3.2	5.89	14	1.52	4.15	7.83	75.48	4.25

*Limited irrigation total water received (precipitation plus irrigation) = 10.08 inches

Date of planting: 5/12/2007
Date of harvest: 7/24/2007
Previous Crop: wheat
Fertilizer: 50-0-0
Herbicide: Sonalan (2pint/ac)
Insecticide: 2xMustang (2pints/ac)
Plot Size: 5ft x 15 ft
Seeding Rate: 6lbs/ac